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AUTHOR Planinc, Carl
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ABSTRACT

A study investigated the nature and extent of telecommunication programs in universities throughout the United States. One hundred and seven institutions were surveyed by questionnaire. The data indicated that 30% operated VHF television channels, 19% UHF channels, and over two-thirds had closed circuit television systems. The survey also revealed that 84% had radio channels and 90% had university owned production facilities. The survey presented statistics on the instructional uses of the systems and their sources of funds and programing. The author concluded that in spite of the widespread availability of telecommunication systems, more innovation and creative uses of the facilities and equipment should be made. (MC)

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STUDY OF TELECOMMUNICATIONS PROGRAMS IN SELECTED UNIVERSITIES IN THE UNITED STATES

Research Project: 01-05-23

Telecommunications Programs

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Carl Planinc, Assistant Professor

Instructional Materials Department

Southern Illinois University

Carbondale, Illinois 62901

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EM010 901

A Study of Telecommunications Programs in
Selected Universities in the United States

Introduction

A few short years ago educational television was hailed as the greatest invention since moveable type. Computers and computer assisted instruction were seen as a boon to individualized pacing of learning, self instruction, and self-motivation of learners. Portable video tape recorders, closed circuit television, teaching machines, micro wave, cable television, 2500 megahertz, video cassettes, satellites--all of these new technological advances were to revolutionize the educational system by providing flexibility and richness of content for all learners from preschool through adult levels. As Dr. Clark Kerr, Chairman of the Carnegie Commission on Higher Education, recently said, "Electronic media can make all knowledge available to everybody when and where they want it, on campus or off."[1]

The U.S. Office of Education reported that four of every five persons in the United States are now within viewing range of educational television. This potential ETV viewing audience has grown to almost 170 million people since 1963, when federal funds first became available to establish and expand ETV stations. A recent report listed only three states without ETV service--Alaska, Montana, and Wyoming. By 1971, over 36 million dollars had been granted to educational television and radio stations in 47 states by the USOE. Millions of dollars have also been forthcoming from industry, various foundations, the Corporation for Public Broadcasting, and many

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[1] Southern Illinoisan, June 4, 1972, p. 8.

other sources. Similar progress and funding has been experienced in related fields of electronic technology.

Since the field of instructional media, and especially telecommunications, is growing and changing at such an accelerated pace; constant and intensive study is mandatory for an adequate understanding of technological advancements and their implications for education.

Many institutions of higher learning have established innovative and creative programs involving the use of all types of educational media. But, how pervasive and extensive are the programs in our colleges and universities? Are research findings being integrated into improved teaching-learning situations through the effective use of electronic equipment? What levels of learning are being affected? What is the extent of in-service teacher training programs to implement the effective use of these instructional tools? And what future plans are being formulated to effect innovation and change and insure acceptance and integration into existing educational programs? These are but a few of the important considerations which seem paramount to a general understanding of the problem. The investigation and study of the nature and extent of telecommunications programs in selected institutions of higher learning and their application to educational problems should be beneficial in establishing relationships and relevance to the entire telecommunications field and its importance to education.

Definition of terms

ETV - educational television
ITV - instructional television
VTR - video tape recorder or recording
CAI - computer assisted instruction
CMI - computer managed instruction
Open circuit - over the air broadcasting
CCTV - closed circuit television
CATV - community antenna television, cable television
2500 Mghz - instructional television fixed service

CPB - Corporation for Public Broadcasting
PBS - Public Broadcasting Service
NET - National Educational Television
NIT - National Instructional Television
CPNIL - Great Plains National ITV Library
WV - Western Video
MPATI - Midwest Program of Airborne Television Instruction
VHF - very high frequency - channels 2-13
UHF - ultra high frequency - channels 14-82
FM - frequency modulation
AM - amplitude modulation

Review of Related Literature

Formal research publications in this area of telecommunications were extremely limited and difficult to find. Coordination of the few existing studies into a comprehensive report was virtually non-existent. Few recent comprehensive, documented publications were found concerning the status of previous or current research on the subject. Some reports emphasized the lack of any meaningful application of technology within our educational system.

In calling educational technology a myth, Dave Berkman stated:

> Considerable excitement was engendered by the promise of this new "industry" that it would become the prime mover behind the revolution necessary to reform an anachronistic, dreary, and all-too-often failing formal education structure.
>
> But so far, nearly a decade, a couple of score of acquisitions, and an endless outpouring of verbiage later, all there is to show are the words!
>
> Panel after panel, meeting after meeting, and convention after convention, together with increasingly frequent newspaper features, magazine pieces, and TV documentaries, are devoted to the theme that we have arrived at the threshold of a massive technological reformation of our schools and colleges. Unfortunately, any such claim can be dismissed as 90 percent gross exaggeration, nine percent outright untruth, and maybe one percent reality. For the most part, the claim rests on the existence of a massive miscellany of machines, incidental cartridges, and other such peripherals of "audio-viz ephemerality" which are displayed at the conventions, widely advertised in the professional journals, and occasionally even sold to gather dust in the storage

> rooms of schools all over America. Yet, none of these gizmoes, jimcracks, singly or in any contrived combinations, are in any way related to--if anything, they would seem the very contradiction of--that total systems restructuring of education which the learning industry promised to effect.
>
> Thus we find the great educational technology revolution always being spoken of as "five years off." It was "five years off" in 1960; it was "five years off" in 1965, and it is still "five years off" today.[2]

Another important study on the impact of educational technology on our schools was conducted by the Commission on Instructional Technology. This report stated:

> All the films, filmstrips, records, programed texts, television, and computer programs do not fill more than five percent of the 1,250,000,000 pupil class hours a week. Some experts put the figure at one percent or less.[3]

The Carnegie Commission on Higher Education in its 12th interim report likened the advent of electronic means of instruction to a revolution in education and stated: "This fourth revolution will not mature in a fortnight. In fact, it now seems to be faltering."[4]

Among the reasons given were the high initial cost of the electronic equipment, the generally poor quality of "software," or materials now available for the use with the equipment, and faculty resistance. While the report said that no one knows how extensively the new technology has been adopted, it still represents a largely ad hoc enterprise, advancing unsystematically.[5]

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[2]Dave Berkman, "The Myth of Educational Technology," The Educational Forum, XXXVI (May, 1972), 451-52.

[3]Ibid., 454.

[4]Southern Illinoisan, p. 8.

[5]Ibid.

The Commission also recommended that the federal government spend between $100 million and $300 million a year over the next seven years to promote the development and expand the use of a technology of instruction based on electronics.

The preceding references seem to be among the most pertinent recent research reports. Even though these show only partial utilization of instructional technology it seems that serious attempts to discover and evaluate major issues and problems have not been rigorously investigated and isolated; and, therefore, dependable and needed evidence does not exist for use in analysis, exposition, discussion, and interpretation. It also seems that instructional technology, especially in telecommunications, has long since established its worth--now a means of extending its benefits to much larger audiences is needed.

Research Design or Methodology

Original plans called for visitations and personal interviews for collection of all data. Only those institutions with innovative or outstanding programs were included on the original schedule. The necessity for additional means of collecting primary data, rather than the exclusive use of visitations and personal interviews, became readily apparent early in the project. To expand the survey into a meaningful study, a questionnaire was prepared and mailed to selected universities throughout the United States. (See attached copy.) Follow-up letters were used to ensure an adequate rate of return. This sampling generally included the major university and at least one state university in each state. The population surveyed through both the personal interview and the questionnaire included program directors, supervisors, coordinators, and other personnel directly concerned with the telecommunications program. The study is largely descriptive analytical research.

All interviews were conducted by the writer, and all questionnaires were interpreted and tabulated by the writer. The possibility of bias in reporting and of subjectivity in recording, analyzing, and interpreting the data was recognized. Every effort was made to insure as much objectivity as possible. Some misunderstanding was apparent in certain sections of the questionnaire, and additional follow-up was necessary to adequately interpret the responses and to categorize the data. Clarification was accomplished and did not affect the validity of the survey.

Findings

The principal concern of this study was to investigate the nature and extent of telecommunications programs in universities throughout the United States. Included in the survey were 107 institutions of higher learning. Responses were obtained from 96, for a return of 89.7 per cent.

The results of an examination of the tabulations of the data collected are shown in the following tables. In assessing television facilities available, Table 1 shows that 29, or 30.2 per cent, of the institutions surveyed were operating VHF television channels. Another 18, or 18.8 per cent, had UHF channels; for a total of 49 per cent of the instutions with open circuit television operations. Over two-thirds, or 66.6 per cent, had CCTV systems, and another 9.4 per cent had 2500 MGHZ facilities. Other television facilities reported included the following: state school network, TV production center, microwave system, CATV, portable VTR's, UHF translator, and TV demonstration facilities.

An even greater percentage of the universities included in the sampling reported radio facilities available, with 63, or 65.6 per cent, with FM channels, and 18, or 18.8 per cent, having AM channels. This is a total of 81, or 84.4 per cent, with radio stations in operation. Others reported carrier current or closed circuit radio systems.

Table 1 also shows that an extremely high percentage, 90.6 per cent, had university owned production studios. Another 4.2 per cent used nearby commercial studios. Others either shared studio facilities, used state ETV studios, or rented separate facilities as needed.

Computers were in use in 76 per cent of the institutions, 35.4 per cent had teaching machines available, and 21.9 per cent had dial access systems. Another 8.3 per cent reported usage of the following facilities: medical

TABLE I

FACILITIES AVAILABLE

	Number	Per cent
Television		
VHF channel	29	30.2
UHF channel	18	18.8
CCTV	64	66.6
2500 MGHZ	9	9.4
Other	15	15.6
Radio		
FM channel	63	65.6
AM channel	18	18.8
Other	6	6.2
Production Studios		
University	87	90.6
Commercial	4	4.2
Other	3	3.1
Other Forms		
Computers	72	76.0
Teaching machines	34	35.4
Dial access system	21	21.9
Other	8	8.3
Equipment		
VTR	92	95.8
Cameras	95	99.0
Film chain	86	89.6
Slide chain	85	88.5
Special effects	73	76.0
Rear screen projection	58	60.4
Other	11	11.4

information service via telephone, CATV, telelecture, film, language carrels, multi-channel slide tape programs laboratory, and personal access via audio tape.

Table 1 also reveals that related equipment seems to be in good supply. An amazing 92 cases, or 95.8 per cent, reported the availability of VTR's; and almost all, 99 per cent, had television cameras. Relatively high percentages were also reported in other catagories, with 86, or 89.6 per cent, having film chains, and 85, or 88.5 per cent, with slide chains. Special effects equipment was available in 76 per cent of the institutions, and 58, or 60.4 per cent, used rear screen projection. Other equipment included 8MM movie cameras, a three camera remote unit, AV carrels, regular mobile units, film transferral recorders, various film production facilities, video projectors, and multi-media lecture halls.

In determining the instructional uses, as shown in Table 2, 40 open circuit and 78 closed circuit television operations were included in the tabulations. Fifty-two, or 54.2 per cent, of these operations reported instructional uses of television for the adult level. ITV was used in 87, or 90.6 per cent, of the cases at the university level. Twenty-four, or 25 per cent, included junior college uses; and teacher training was listed in 60, or 62.5 per cent, of the responses. Table 2 also shows that television was used for instructional purposes in 36, or 37.5 per cent, of the cases at the secondary level; and in 39, or 40.6 per cent, at the elementary level. Preschool uses were listed in 32 instances, or in 33.3 per cent, of the cases. Other instructional uses included the following: counselor education, broadcast training, post graduate courses, personnel training, community medical TV hookup with local hospital via TV monitor, vocational training, portable video use, and tontinuing education.

TABLE 2

INSTRUCTIONAL USES

	Number	Per cent
Television (40 open circuit and 78 CCTV)		
Adult	56	54.2
University	87	90.6
Junior College	24	25.0
Teacher Training	60	62.5
Secondary	36	37.5
Elementary	39	40.6
Preschool	32	33.3
Other	16	16.6
Radio (54 FM and 17 AM)		
Adult	38	39.6
University	43	44.8
Junior College	4	4.2
Teacher Training	7	7.3
Secondary	8	8.3
Elementary	10	10.4
Preschool	3	3.1
Other	7	7.2
Computer (CAI)		
Adult	15	15.6
University	50	52.1
Junior College	4	4.2
Secondary	3	3.1
Elementary	3	3.1
Other	2	2.1
Computer (Administrative)		
Registration	65	67.7
Records	73	76.0
Research	64	66.6
Payroll	67	69.8
Scheduling	58	60.4
Other	9	9.4

The information in Table 2 regarding instructional uses of radio included 54 FM and 17 AM operations. Radio was used at the adult level in 38, or 39.6 per cent, of the cases and in 43, or 44.8 per cent, of the instances at the university level. Uses at other levels were extremely limited, with only 4 instances of junior college use, 7 for teacher training, 8 for secondary education, 10 for elementary, and 3 for preschool use. Other uses of radio for instructional purposes were FM for campus area only, general entertainment, general music and news, and 3 student stations not used for in-school instruction.

Computer use was divided into two catagories; computer assisted instruction and administrative use. As further indicated in Table 2, CAI use was reported at the adult level in 15 institutions, or 15.6 per cent of the cases. The greatest use was at the university level, with 50, or 52.1 per cent, of the institutions reporting CAI usage at this level. In close correlation with radio usage, CAI use was very limited at other levels with only 4 cases of junior college use, 3 secondary, and 3 elementary. Others listed one computer managed instruction terminal and one CAI operation exclusively for research purposes.

Table 2 also shows that administrative uses of computers were quite extensive, with 65, or 67.7 per cent, of the institutions using computers for registration purposes. The greatest number, 73, or 76 per cent, of the institutions used computers for keeping records; and 64, or 66.6 per cent, used computers for research. Payroll usage was reported in 67, or 69.8 per cent, of the instances; and scheduling in 58, or 60.4 per cent, of the cases. Other minor administrative uses included library, purchasing, inventory control, and budget uses.

Sources of programing and distribution of local productions were included in the survey because of their relationship to facilities available and the

TABLE 3

SOURCE OF PROGRAMING

	Number	Per cent
Local Production		
Adult	52	54.2
University	82	85.4
Junior College	20	20.8
General	38	39.7
Elementary and secondary	24	25.0
Preschool	15	15.6
Other	0	0.0
Distribution		
Local only	51	53.1
Regional	36	37.5
State	44	45.6
National	26	27.1
Other	2	2.1
Other Sources		
PBS	48	50.0
NET	46	47.9
Regional network	33	34.4
State network	31	32.3
Commercial	19	19.8
NIT	35	36.6
GPNIL	28	29.2
WV	8	8.3
MPATI	17	17.7
Other	10	10.4

use of these facilities and equipment. Table 3 reveals that over half, or 54.2 per cent, of the institutions produced programs locally at the adult level. Local production for university level programing was reported in 82, or 85.4 per cent, of the responses. Twenty institutions, or 20.8 per cent, produced programs for junior college use; and 38, or 39.7 per cent, produced general programing. Only 24, or 25 per cent, of the operations produced elementary and secondary school programing, and 15, or 15.6 per cent, produced for preschool usage. No other local production areas were reported.

Although follow-up studies indicated some misunderstanding in reporting distribution of local productions, this was not of sufficient magnitude to affect the validity of the study. Table 3 indicates that 51, or 53.1 per cent, of the institutions distributed locally produced programs only over their own facility. Another 36, or 37.5 per cent, distributed local productions on a regional basis: 44, or 45.6 per cent, on a state basis; and 26, or 27.1 per cent, on a national basis. Other distribution systems included one for campus only and one on an international basis.

Since it is evident that local production does not account for total programing of the operations, other sources are important and relevant to this survey. As emphasized in Table 3, PBS was listed as the most common supplier of other programing, with half of the institutions reporting to this effect. NET was next, with 46, or 47.9 per cent, of the installations using NET programing. Regional networks supplied programs to 33, or 34.4 per cent, of the operations; state networks to 31, or 32.3 per cent; and 19, or 19.8 per cent, used some commercial programing.

NIT was the main supplier of instructional programing, with 35, or 36.6 per cent, of the institutions receiving part of their ITV programs from this source. Next was GPNIL, with 28, or 29.2 per cent; and WV, a relative

TABLE 4

UTILIZATION TRAINING FOR CLASSROOM TEACHERS

	Number	Per cent
Regular credit courses	59	61.4
Non-credit courses	27	28.1
Workshops	62	64.6
Seminars	42	43.8
Conferences	48	50.0
Other	8	8.3

newcomer in the field, with 8, or 8.3 per cent. MPATI, now merged with GPNIL, was supplying programs to 17, or 17.7 per cent of the operations. Other sources included ETS and various other local networks or associations.

Since effective utilization of any instructional material or educational tool by the teacher is of paramount importance in the success or failure of any system of instruction, the training available to teachers should be a vital factor in planning for widespread implementation and acceptance. Table 4 shows that 59, or 61.4 per cent, of the institutions offered regular credit courses in utilization of existing telecommunications systems, while 27, or 28.1 per cent, offered non-credit courses. The largest number, 62, or 64.6 per cent, trained for effective utilization through workshops. Forty-two, or 43.8 per cent, conducted seminars; and 48, or 50.0 per cent, held conferences for educators. Other methods included micro-teaching experiences, classroom episodes, video taping, a television reception clinic, and graduate school observation.

Sources of funds for the installation and operation of telecommunications facilities many times has a major effect on the nature and extent of the operation. Table 5 shows that the greatest source of funds was from the regular university budget, with 85, or 88.5 per cent, of the institutions designating this as the major source. Local contributions were reported in 16, or 16.6 per cent, of the cases. Thirty-three, or 34.4 per cent, listed special state funds, and half the institutions listed some federal funding. Elementary and secondary schools were included as sources of funds in 21, or 21.9 per cent, of the instances. Foundation funds as a source were listed 32 times, or by 33.3 per cent, of the institutions; with industry being reported by 17, or 17.7 per cent. Other sources included the Corporation for Public Broadcasting in 8 instances, various grant project funds, and

TABLE 5

SOURCES OF FUNDS

	Number	Per cent
Regular university budget	85	88.5
Local contributions	16	16.6
Special state	33	34.4
Federal	48	50.0
Elementary and secondary schools	21	21.9
Foundations	32	33.3
Industry	17	17.7
Other	11	11.5
New recent sources	1	1.0

student fees. Only one institution reported a new recent source, and this was a foundation grant.

The survey also requested information concerning any innovative or exceptionally successful production, utilization, or distribution practices or techniques which might be beneficial to others. Responses were extremely limited in the production category, with only 3 institutions reporting in this area. One listed taping conversational interviews with guest speakers rather than a series of lectures for ITV, another reported a highly successful operation in the production of super 8 cartridge films, and the third reported a very successful plan for commercial sale of single concept film series. Further investigation and study would be necessary in each instance to make an objective determination as to the relative success or innovativeness of each project.

Reports of successful or innovative utilization practices or techniques were more numerous and varied. Nine universities, ranging from the West through the Midwest to the East, listed the successful use of CCTV in many courses for demonstrations, laboratory, micro-teaching, methods, self-instruction, or self-evaluation. It is readily apparent from the preceding discussion that many other CCTV installations were in operation, but evidently did not consider their practices innovative or highly successful.

Seven institutions from various locations throughout the United States reported using or circulating taped programing to industries to aid junior colleges with insufficient faculties or to supplement correspondence courses. Credit courses, some with telephone talkback, were offered in both graduate and undergraduate programs by 5 universities, mostly in the West and the East.

One university in the South reported the use of a utilization kit to accompany the teacher's manual for a specific ITV series. This kit contained

visuals used in the production of the telecast, graphics, models, and artifacts; and thus allowed the student to have contact with the real items.

One Western university reported the centralization of independent language laboratories with other independent study programs and the use of a single audio-retrieval system with an increasing number of access stations. This plan will eventually interconnect all campuses with similar systems within the state.

Other reports included a highly successful in-service teacher education program, the re-broadcasting of certain evening programing for school use, re-broadcasting of one lesson in a series in the time slot just prior to the next lesson being broadcast for the first time, the use of a videotape electrowriter, the development of a media center providing student access to taped lectures with pertinent visual material presented via television, and a community medical television network with telephone talkback facilities. It seems apparent that further investigation and study are necessary to determine the exact nature and extent of usefulness of many of these programs.

Innovative or successful distribution methods or techniques included a tie-in with cable television in two instances, and an institution with a two-way microwave system between two campuses allowing for both audio and video in addition to 20 channels of data information for remote terminals. This two-way system allows the teacher to see the students as well as the students to see the teacher.

Another Western university reported the extension of the CCTV system to the student residence halls for student access to ITV in those areas, while another extended the CCTV system to include 19,000 homes in the immediate area. The use of a 2500 MGHZ system strictly on campus (within a range of 2000 feet) was also reported, with a radio loop circuit rented from the

telephone company to allow for controlled circuitry from the point of broadcast. A major university in the East reported the broadcasting of an innovative program series over commercial channels.

Other reports included the use of kodaphone and beepers for distribution of audio information via radio to stations within the state, and the establishment of an informal radio network with commercial stations in the area using direct off-air pick-up from an FM station. Once again, additional data are necessary for a better understanding of many of the preceding operations.

The last part of the survey deals with reports of definite plans soon to be implemented or planned for the future. This section seems to emphasize the tremendous growth underway or planned in the telecommunications area in our universities. Nine institutions scattered throughout the country reported definite plans for development or expansion of telecommunications or media resource centers, departments, or offices. Five are planning installation of FM channels or expansion of existing ones with improvements in programing, power, or other facilities. Four universities reported the installation or expansion of CCTV systems, four are converting from monochrome to color television equipment, four are planning instruction via TV microwave, four are building new studio facilities, and four are developing two-way video interconnections with campuses and centers within a state university system.

Three universities, all in separate states, are involved in developing state networks, and 3 others are establishing a system or network to broadcast credit courses for workers in industry. Two institutions are installing ITFS systems, two reported using students in advanced classes to staff and produce programing for the CATV system, and 2 others were in the process of completing cable connections to all buildings.

Other reports included the development of a media production room for faculty, development of an electronic classroom for student response, and using key people in various departments to help produce audio-tutorial systems. Another reported the use of CCTV monitors to display computer outputs to large classes, with this same system for graphics, models, charts, etc. through the use of an in-class keyboard selection.

Other reports listed changes in film and equipment distribution services, with free delivery of film and equipment on campus and satellite film repositories rather than a central repository; the development of a copyright policy; a centralized sales office for sale of videotapes, films, etc.; the development of a new biology series in color on videotape for distribution to 10 institutions within the state; the development of a communications center on campus equipped for CCTV and other instructional programs; installation of a campus radio station; cooperative efforts for production and distribution of programing by personnel and facilities of a state ETV network; the development of radio and/or television material designed to assist students to earn "credit-by-examination"; and the installation of a statewide CATV grid interconnection with a central communication center.

Many of the proposed plans have already been implemented and others are in various stages of completion. Continued progress is imperative in the field of telecommunications, and the preceding data reveals to some degree the nature and extent of this progress.

Summary, Conclusions, Recommendations

The purpose of this study was to investigate the nature and extent of telecommunications programs in institutions of higher learning throughout the United States and to evaluate or relate the programs with reference to their

contribution to the total educational program. Background information was presented to afford a general knowledge of telecommunications, its history, and its future promise or possibilities.

A review of related literature and research emphasized the non-existence or scarcity of pertinent, comprehensive reports in this area. Some reports stressed the lack of any meaningful application of technology within our educational system. Others seemed to show promise or offer hope for future progress in the field. Since it seemed that no serious attempts had been made to assess the nature, extent, and other related aspects of existing programs, this study was conducted in an attempt to isolate, study, and evaluate these specific problem areas.

The methods and procedures used in this study included a field interview schedule and a questionnaire for primary collection data in which program directors, supervisors, coordinators, and other personnel directly concerned with the telecommunications programs were contacted. Responses were catagorized, classified, and tabulated. Some difficulty in interpretation was experienced, but remedial measures were taken to insure objectivity and validity.

Summary of Findings

A summarizarion of the evidence in this study seems to indicate that several salient points may be enumerated as follows:

1. Physical facilities and equipment are available in most institutions of higher learning in the United States.
2. Instructional uses of the facilities are widespread and varied.
3. Local production of programing is an important source, along with a variety of other sources.
4. Utilization training courses for teachers are being offered at most institutions.
5. The regular university budget still remains the most important source of operational funds.

6. Innovative or exceptionally successful production, utilization, or distribution practices or techniques are extremely limited in number and subjective in nature.

7. Present and future plans are primarily concerned with the installation of new facilities or the expansion of existing ones, with very little attention being given to improvement of programing or the development of innovative or creative uses of the facilities.

The evidence of this entire study, determined to some extent by a subjective analysis of the responses and attitudes of those interviewed, emphasized that the acquisition of physical facilities, equipment, and other "hardware" is the primary and sometimes overwhelming consideration in establishing a telecommunication system. Many times, this over-emphasis on facilities and equipment seemed to overshadow any definite plans for instructional uses or effective utilization. Evidence exists that much equipment is not being fully utilized or is not being used to improve educational practices or opportunities. This is further evidenced in noting that most universities seem to have a wealth of equipment, but these same institutions reported very few innovative or creative uses of their facilities. Even those reported were subject to interpretation and pointed up the need for additional investigation and study of each operation.

Instructional uses of both open and closed circuit television systems seemed consistently high and varied at all levels, from adult use through preschool. In many instances the university use overshadowed other categories primarily because of on-campus use for teacher training and for large class consumption. This same situation prevailed with instructional uses of radio. Use of CAI was limited almost entirely to the university level and most computers were also being used for a variety of administrative purposes.

The results of the investigation also revealed that the vast majority of the locally produced programs were for use at the university level, with the

next highest category for the adult level. Some programing is also produced locally for all other educational levels. Over half the locally produced programs were for local use only. Over one-third of the institutions distributed these programs regionally, and over 45 per cent distributed local productions on a state-wide basis. Over one-fourth of the universities had national distribution of their locally produced programs, and one institution had achieved international distribution of some of its productions.

Half the institutions listed PBS as a major source of programing, and almost half also listed NET. Regional and state networks supplied a good portion of other programs, and almost one-fifth of the installations received programing from commercial sources. NIT was the chief supplier of ITV programing, with GPNIL running a close second. MPATI and WV were other suppliers of ITV series. Further investigation revealed that most ITV programing for elementary and secondary school use was secured from the ITV libraries, with only a small percentage being produced locally.

Almost all institutions reported a variety of types of utilization training for teachers. Workshops were listed as the most common type of training. Over 60 per cent also reported regular credit courses for utilization training. Half the institutions held conferences for classroom teachers, and seminars were conducted in 42 universities. Non-credit courses were reported in 27 instances. Even though this evidence exists, the relative effectiveness of all types reported, the extent of coverage, and the methods and techniques used would prove to be a major factor in any determination of the adequacy or availability of utilization training for classroom teachers.

Over 88 per cent of the institutions reported the regular university budget as the major source of funds for the telecommunications program. Half the institutions list federal funds as a major source, and over one-third reported

special state funds available. One-third of the universities received funds from various foundations, and over one-fifth listed elementary and secondary schools as a source. Local contributions and industry were also listed as sources in some instances. Eight institutions included the CPB, and this number has probably increased rapidly since this survey was made. The type of station, the nature and intent of the operation, and many other factors are directly influenced by sources of funding; as well as by the adequacy of funds for operation, production, research. creative programing, and other necessary functions of the facility.

As previously reported, it is interesting to note that the overwhelming majority of the institutions did not report any innovative or highly successful production practices or techniques, even though almost all were reportedly well equipped. Utilization and distribution practices were much more numerous and were quite varied in nature. It is again interesting and important to note that most of these practices or techniques involved the use of, addition to, or purchase of more equipment or facilities.

The preceding situation also seems to exist with reference to present and future plans. Although these plans were extensive, the vast majority included new facilities and equipment or the expansion of existing facilities. Very few plans could be interpreted as primarily for the development of innovative programing or for creative uses of the facilities.

Conclusions

It seems apparent that, if institutions of higher learning are to provide leadership in the telecommunications field, more innovative and creative uses of facilities and equipment must be forthcoming. In many instances, long range planning must include more than the acquisition of new

facilities or the expansion of existing ones. New directions must be sought to integrate technology into improving educational programs and practices.

Instructional uses must be expanded and improved. Favorable attitudes toward telecommunications systems should be created by special emphasis on the role of technology in education to help dispel the many prevalent misunderstandings in this area. Necessary funds for adequate equipment and for materials for effective instructional use should be provided for innovative programs and research and development.

It is also concluded that increased local production is a prime requisite if public television and radio are truly to provide alternatives and to satisfactorily serve the local and regional needs of their particular audiences. Local involvement in the production of programs can serve as the lifeblood of a system and can encourage and ensure the local and regional support necessary for the successful and continued operation of the facility. In the same manner, personal involvement in local production of instructional programs can result in cooperation and support from faculty and staff. This can be a determining factor in the acceptance and maximum utilization of the technological facilities. This support and widespread effective use is mandatory if necessary funding is to be obtained on a continuing basis.

Methods and procedures for training teachers and other personnel for the effective utilization of all types of programing must be improved and expanded. Many times, unfavorable attitudes can be altered through a program based on supplying basic information necessary for an adequate understanding of the advantages, educational uses, and steps in effective utilization of any instructional material. Encouraging and developing a willingness to accept change and innovation in educational methods and procedures is a prerequisite to the successful implementation of technology into educational systems.

It seems apparent that, in addition to the regular university budget, new and more adequate sources of funds will be forthcoming when extensive, documented evidence exists that improved teaching-learning situations are being integrated into our educational system through the effective use of electronic equipment. These situations must be extensive and pervasive, must be based on comprehensive research findings, and must include definite plans to effect innovation and change and insure acceptance and integration into existing educational programs. Innovative and exceptionally successful production, utilization, or distribution practices or techniques will become a part of the necessary evidence and must multiply and become more objective in nature.

As evident in the preceding discussion, if present and future plans are to give attention to improvement of programing and the development of innovative and creative uses of the facilities rather than the installation of expansion of facilities; educational leadership must be a prime consideration. If administrators and other personnel involved with telecommunications programs and systems are to provide this leadership for the institution and the community, the necessary time, finances, and authority for planning and implementation of programs must be provided. In many instances, authority and responsibility for the implementation, operation, and evaluation of the program should be delegated for expediency and efficiency. Attendance and participation in meetings, conferences, workshops, etc., should be encouraged and considered a necessary part of administrative and teaching functions; and time and funds should be available. Methods and techniques for informing educators about technological advances are inadequate and should be improved. In-service teacher training in the uses of technology in education through extension courses, visitations, workshops, and conferences should be provided

for effective utilization in the classroom. All avenues and approaches must be utilized to inform and secure cooperation and support from educators and the general public. The future of our educational system certainly will be influenced by the success or failure of this all-important endeavor.

Recommendations

It is recognized that there are many limitations to this study, and the results point up or emphasize the need for further investigation into many areas. This study, however, has brought into focus certain aspects of the problem about which the following recommendations can be made to assist in a better understanding of technological advancements and their implications for education.

1. Guidance and direction from the U.S. Office of Education, State Departments of Education, State Boards of Higher Education, and other agencies knowledgeable in the telecommunications field should be intensified. Every effort must be made to insure development of an orderly and practical telecommunications system throughout the country. Empire building and duplication of costly systems must be minimized.

2. Use of facilities and equipment should be increased. Instructional uses must be expanded and improved. Educational, cultural, public affairs, and entertainment uses must also be expanded and improved and directly related to the needs and interests of the community. Personal involvement by educators and the lay public can enhance the educational uses of the facility.

3. Concerted efforts should be made to establish open lines of communication at all levels to ensure adequate information flow to all institutional personnel. This same relationship must also be established with the general public and responsiveness to expressed needs and interests must be proven.

4. A continuing effort should be made to dispel teacher and administrator resistance to change and innovation, inertia, apathy, and ultra-conservativeness, as well as to attract highly qualified and dedicated personnel as members of the teaching profession.

5. Adequate funding for telecommunications programs must be provided once definite and detailed plans are formulated for the improvement of educational opportunities.

6. Consolidation of efforts should be intensified and realistic planning should be directed at solving problems. This could improve many of the preceding situations; such as duplication of facilities, restricted use of equipment, communication flow, administrative leadership, resistance to change and innovation, financing, programing, and physical facilities.

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TELECOMMUNICATIONS QUESTIONNAIRE

Please check all that apply to your institution.

Section I. FACILITIES AVAILABLE

Television

( ) VHF Channel No. _____
( ) UHF Channel No. _____
( ) CCTV
( ) 2500 MGHZ
( ) Other (Please Explain)

Radio

( ) FM Channel
( ) AM Channel
( ) Other (Please Explain)

Studios

( ) University
( ) Commercial
( ) Other (Please Explain)

Other Forms

( ) Computers
( ) Teaching Machines
( ) Dial Access System
( ) Other (Please List)

Equipment

( ) VTR
( ) Cameras
( ) Film Chain
( ) Slide Chain
( ) Special Effects
( ) Rear Screen Projection
( ) Other (Please List)

Section II. INSTRUCTIONAL USES

Television ( ) Open Circuit ( ) Closed Circuit

( ) Adult
( ) University
( ) Junior College
( ) Teacher Training
( ) Secondary
( ) Elementary
( ) Pre-school
( ) Other (Please List)

Radio ( ) FM ( ) AM

( ) Adult
( ) University
( ) Junior College
( ) Teacher Training
( ) Secondary
( ) Elementary
( ) Pre-school
( ) Other (Please List)

Computer

CIA (Computer Assisted Instruction)

( ) Adult
( ) University
( ) Junior College
( ) Secondary
( ) Elementary
( ) Other (Please List)

Administrative

( ) Registration
( ) Records
( ) Research
( ) Pay Roll
( ) Scheduling
( ) Other (Please List)

Section III. SOURCES OF PROGRAMING

Local Production

( ) Adult Level
( ) University
( ) Junior College
( ) General
( ) Elementary and Secondary
( ) Pre-School
( ) Other (Please List)

Distribution

( ) Local Only
( ) Regional
( ) State
( ) National
( ) Other (Please Explain)

Other Sources

( ) PBS
( ) NET
( ) Regional Network
( ) State Network
( ) Commercial
( ) NIT
( ) GPNIL
( ) WV
( ) MPATI
( ) Other (Please List)

Section IV. UTILIZATION TRAINING FOR CLASSROOM TEACHERS

( ) Regular Credit Courses
( ) Non-credit Courses
( ) Workshops
( ) Seminars
( ) Conferences
( ) Others (Please List)

Section V. SOURCES OF FUNDS

( ) Regular University Budget
( ) Local Contributions
( ) Special State
( ) Federal
( ) Elementary and Secondary Schools
( ) Foundations
( ) Industry
( ) Other (Please List)

( ) New Recent Sources (Please List)

Section VI. Please list and briefly describe any innovative or exceptionally successful production, utilization, or distribution practices or techniques which may be beneficial to others. (Please enclose informative or descriptive materials if available.)

Section VII. Please list and briefly describe any definite plans soon to be implemented or planned for the future. (Please enclose informative or descriptive materials if available.)

_____
Name of Institution

_____

_____
Name and title of person reporting

Thank you for your cooperation.

Please return to: Dr. Carl Planinc
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Southern Illinois University
Carbondale, Illinois 62901